



REPORT

ON

GAMIFICATION APPLICATION AREAS

CAP707: PAPER WRITING-II

SUBMITTED TO LOVELY PROFESSIONAL UNIVERSITY
IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE AWARD OF DEGREE OF

M.C.A (LATERAL ENTRY)

UNDER THE SUPERVISION OF

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CERTIFICATE

This is to certify that Akanksha Tiwari, Mani Sharma and Md. Saddam Hussain are working on research paper titled “Gamification” under my guidance and supervision. To the best of my knowledge, the present work is the result of his/her original investigation and study. No part of the research has ever been submitted for any other degree.

The research is fit for the submission and the partial fulfilment of the conditions for the award of Master of Computer Applications.

Date: 29-04-2015

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DECLARATION

We hereby declare that the research entitled, “**Gamification**”, which is being submitted in partial fulfilment of the requirement for award of the Degree of MCA to “**Lovely Professional University**” is an authentic record of our own work done under the guidance of **Mr. Parul Khurana** at Lovely Professional University. The matter reported in this report is entirely our original work and all ideas and references have been duly acknowledged. It does not contain any work for the award of any other degree.

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ABSTRACT

In this research paper, we are proposing to implement a new interface for creating a timetable of different courses for the university. This is such an interface where students have flexibility to fill their own preference or choice for timetable based upon their different constraints. In a university there are many lectures, labs, rooms, sections, teachers etc. which should be arranged in such a way so that time slot problem must be solved and each resource are assigned effectively to timetable after satisfying all the constraints anyhow.

This paper is a result of survey satisfaction of timetable system with fulfilling all constraints and solutions with respect to faculty, student and resources so that both must be satisfied at extent. Here we are giving opportunity to all the students to design their own timetable through an online interface which already contains typical constraints/challenges predefined by academic operations coordinator in all respects. The feedback given by students on this is also being considered for further action and students are also agree upon their regular feedbacks on this interface.

INTRODUCTION

There are many schools/institutes/universities where they have to set the timetable for the scheduling of classes manually. It may happen that the timetable which is being allocated by the University for Different Courses may not be satisfying all constraints for every student as well as for faculty members.

Moreover creating a timetable is very essential task which takes much time to design and after all this regressive exercise; it becomes very important that academic operations coordinator must be able to satisfy all the users of this system. So creating a timetable along with so many constraints is not an easy task. One may observe following timetable constraints:

- Capacity of rooms
- Number of students
- Faculty timings
- Student timings slot
- Room availability
- Overlapping of resources
- Break time etc.

While designing a timetable there are so many constraints as listed above which are required to be take care of. It is really important to determine the time slot of both faculty as well as student for better timetable and moreover satisfaction of all the constraints is also very crucial in this.

Therefore we are looking for key areas which can really affect the complete system/process. To implement this on better grounds, we conducted one survey about the timetable which is currently running in the school of computer applications. After considering and analyzing survey results, we are in the implementation process of the same.

CHALLENGES

Typical challenges have been divided into two major categories:

1. Hard Constraints
2. Soft Constraints

Hard Constraints are constraints which have to be followed by making timetable. Hard constraints are having higher priorities. In other words we can also say that hard constraints are constraints which cannot be avoid.

Hard Constraints on which we are going to focus on are –

1. Classes timing should be in between 9-5 only.
2. At least one hour lunch break should be there for every section/faculty member.
3. It must be 5 days / 6 days a week i.e. as per guidelines.

Soft Constraints on which we are going to focus on are –

1. Not more than 4 consecutive lectures in a day.
2. There should be some free time slot allotted for Muslim prayers or any curricular activities.
3. There should not be 3 hrs / 4 hrs gap between classes.
4. Not more than 4 theory classes in a day.

Proposed Work Plan

As we know that there are so many different kinds of courses provided by the university. And each course is containing Lecture, Tutorial and Practical as per their requirement. So there should be a way through which all these classes should be arranged properly. So university needs to create a timetable in such a way by which students must be satisfied with their

timetable. In the current scenario, administrators are making timetable while making timetable they are considering their own constraints. They are considering constraints as listed above.

At the end final timetable is just handed over to the students. That timetable is fixed. Students have to follow that timetable. In that timetable students may have some challenges or constraints. Due to that they may not feel satisfactory because of this they may not attend classes in regular or they may feel uncomfortable as well.

We have done a research through which we have seen that the major problems faced by students are –

- They are attending more than 5 consecutive classes, due to this they feel so tired and they can't attend classes properly.
- They are not feeling comfortable for attending early morning classes like 8-9 am or late evening classes like 5-6 pm.
- They do not feel comfortable when there is maximum like 3-4 hours gap between classes.
- They also feel uncomfortable when no lunch break is providing to them.

So these are the problems by which we can say that timetable is an important issue for students as well as faculty also. We think that there should be a link between administrator and students so that an effective timetable should be generated through which students and faculty both should be satisfied in their timetable.

After studying the current scenario, we have seen that there is a problem. But the question is where the actual problem exists in the timetable system. So to identify the actual problem we have conducted survey. That survey is regarding existing timetable system by which we can find that what are the different problems being faced by students.

We have conducted a survey in School of Computer applications, Lovely Professional University. We have taken the feedback from 188 students of School of computer Application students. Out of those 188 students, 85 students are of Under Graduation and 103 students are of Post-Graduation programme. This survey is containing 10 individual type questions. In all the 10 questions, 5 question are based on the problems which students are facing and 5 questions are the solutions which we want to provide them.

This Questionnaire has included 10 questions as follows:-

Reg No: _____

Roll No: _____ Section: _____

Level (UG/PG): _____

Q1. Would you like to have classes at early morning (8-9)?

- Yes
- No

Q2. Are you comfortable in attending classes in evening (5-6)?

- Yes
- No

Q3. Would you like to attend Theory classes in morning (Before 12)?

- Yes
- No

Q4. Would you like to attend Theory classes in evening (After 2)?

- Yes
- No

Q5. How much gap is acceptable between consecutive classes?

- No gap (Consecutive 5 classes)
- 2 hrs
- 3 hrs
- 4 hrs

Q6. Preferred lunch break-

- 12-01
- 01-02
- 02-03
- No lunch break (Can attend 5 hrs consecutive classes)

Q7. Can students be given a choice to select particular faculty/ course/ time slot for any class?

- Yes
- No

Q8. Do you want any day off in a week? If yes then please specify.

- Yes Day _____
- No

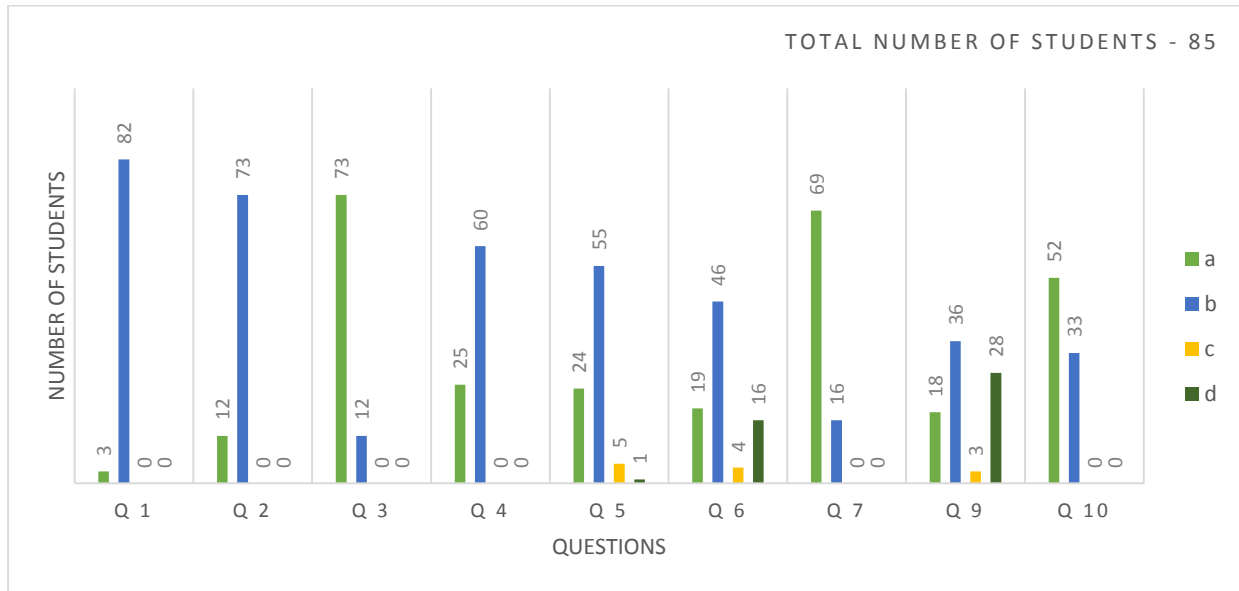
Q9. Select as per your preference. 1 means first and 4 means last.

- Lunch at 01-02 only ()
- No class at 9 o'clock ()
- No theory class at 9 o'clock ()
- Not more than five consecutive classes in a day ()

Q10. Do you want any interface by which you can book your own class slot just like you are booking a movie show?

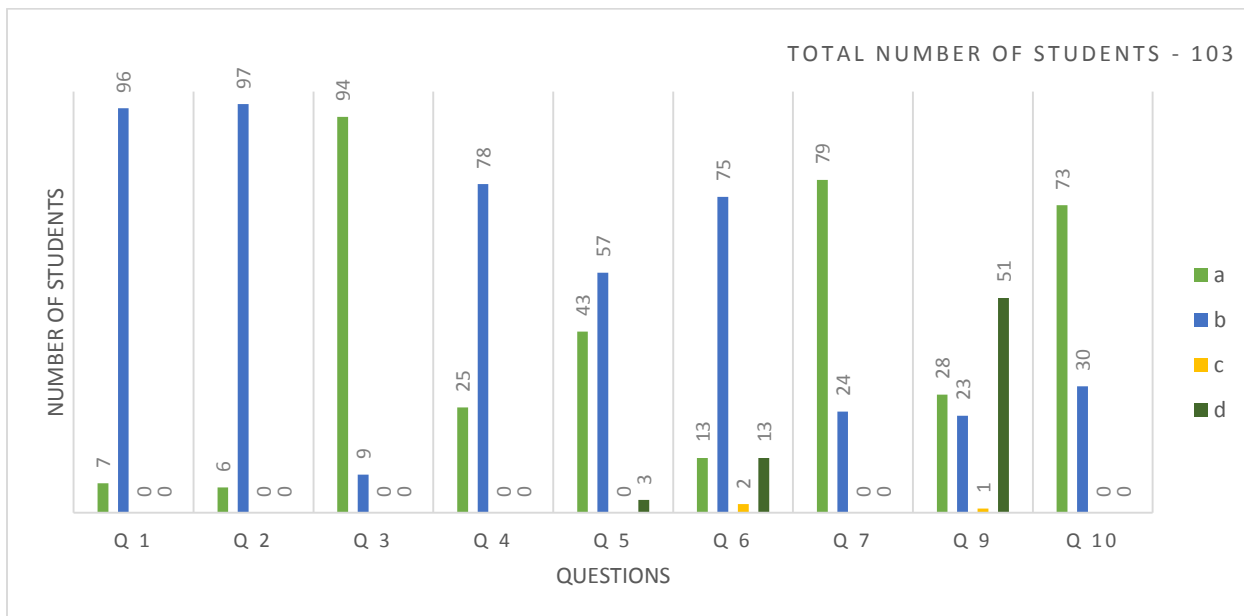
- Yes
- No

Graph of Survey conducted on Under Graduation students -



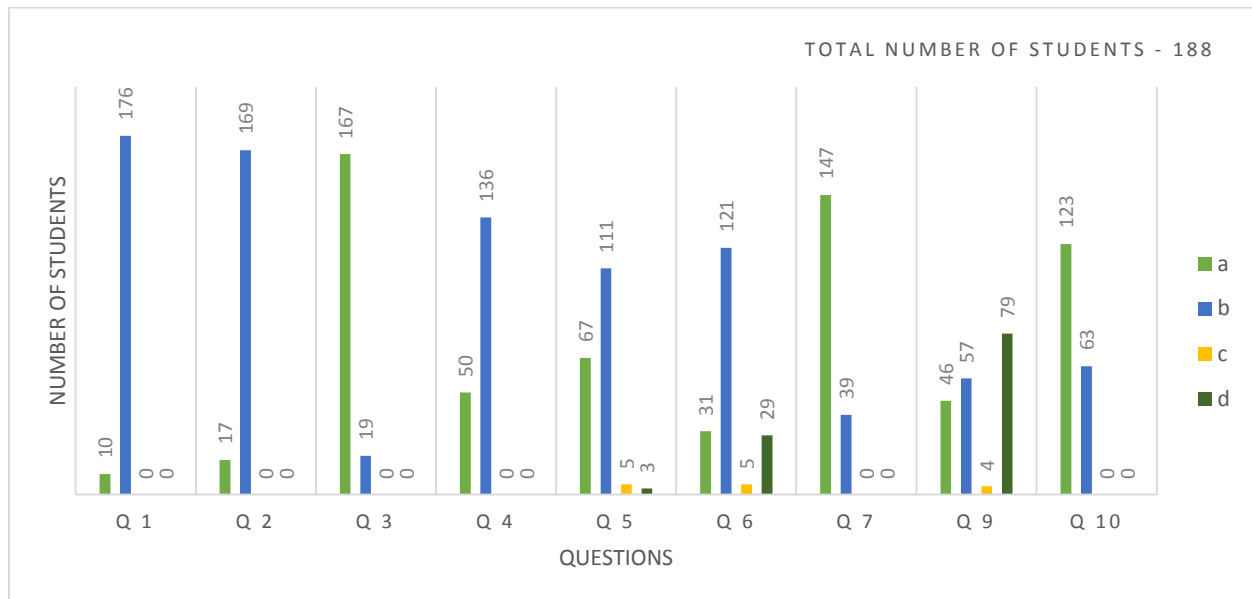
Graph 1

Graph of Survey conducted on Post-Graduation students -



Graph 2

Combined graph of UG and PG –



Graph 3

These graph shows result of our survey which we have taken. This graph is containing 4 options a, b, c, and d. And shows that majority of students has opt for which option. In the above graph-

First question is that Are students happy by attending early morning (8-9 am) classes. We have given two options (a) yes (b) no. For UG in the first graph, 82 students out of 85 have opted for option (b). And for PG in the second graph, 98 students out of 103 have opted for option (b). From the third graph we have observed that total 176 students out of 188 have opted for option (b). Based on this result we have analyzed that most of the students facing problem while attending early morning classes.

Second question is that Are students happy by attending late evening (5-6 pm) classes. We have given two options (a) yes (b) no. For UG in the first graph, 73 students out of 85 have opted for option (b). And for PG in the second graph, 97 students out of 103 have opted for option (b). From the third graph we have observed that total 169 students out of 188 have opted for option (b). Based on this result we have analyzed that most of the students facing problem while attending late evening classes.

Third question is that Are students comfortable while attending Theory classes in morning (Before 12). We have given two options (a) yes (b) no. For UG in the first graph, 73 students out of 85 have opted for option (a). And for PG in the second graph, 94 students out of 103 have opted for option (a). From the third graph we have observed that total 167 students out of 188 have opted for option (a). Based on this result we have analyzed that most of the students wants to attend theory classes in morning (Before 12).

Fourth question is that Are students comfortable while attending Theory classes in evening (After 2). We have given two options (a) yes (b) no. For UG in the first graph, 60 students out of 85 have opted for option (b). And for PG in the second graph, 78 students out of 103 have opted for option (b). From the third graph we have observed that total 136 students out of 188 have opted for option (b). Based on this result we have analyzed that most of the students do not want to attend theory classes in evening (After 2).

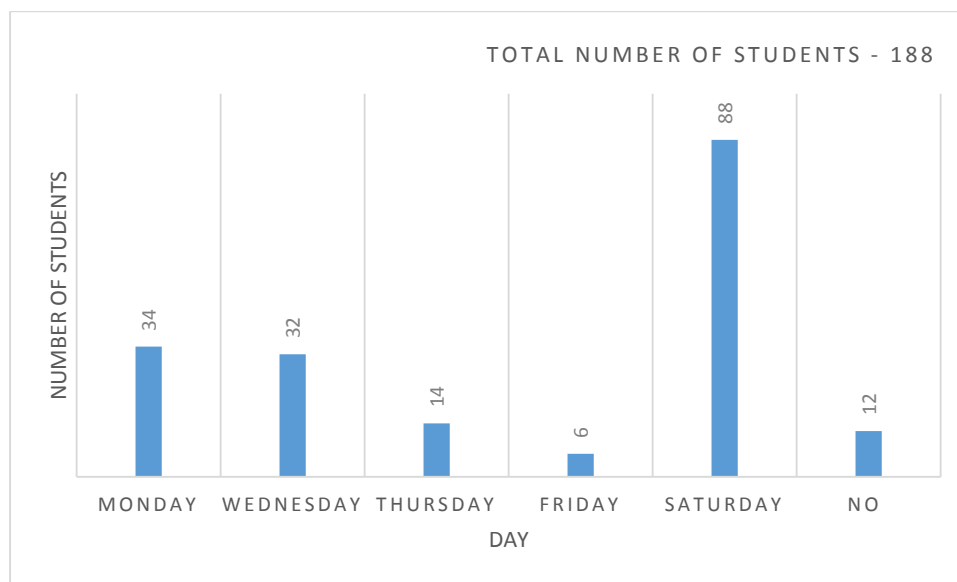
Fifth question is that how much gap is acceptable between consecutive classes. We have given four options (a) No gap (consecutive 5 classes) (b) 2 hrs. (c) 3 hrs. (d) 4 hrs. For UG in the first graph, 55 students out of 85 have opted for option (b). And for PG in the second graph, 57 students out of 103 have opted for option (b). From the third graph we have observed that total 111 students out of 188 have opted for option (b). Based on this result we have analyzed that most of the students' wants 2 hrs gaps between classes.

Sixth question is that preferred lunch break for students. We have given four options (a) 12-01 (b) 01-02 (c) 02-03 (d) No lunch break (can attend 5 hrs. consecutive classes). For UG in the first graph, 46 students out of 85 have opted for option (b). And for PG in the second graph, 75 students out of 103 have opted for option (b). From the third graph we have observed that total 121 students out of 188 have opted for option (b). Based on this result we have analyzed that most of the students' wants lunch break from 01-02.

Seventh question is that can students be given a choice to select particular faculty/ course/ time slot for any class. We have given two options (a) yes (b) no. For UG in the first graph, 69 students out of 85 have opted for option (a). And for PG in the second graph, 79 students out of 103 have opted for option (a). From the third graph we have observed that total 147 students out

of 188 have opted for option (a). Based on this result we have analyze that most of the students' wants to select particular faculty/ course / time slot for classes by their own.

Eighth Question is that students want any day off in a week? If yes then please specify. We have given them two options (a) Yes and specify the day name. (b) No



In this graph we have seen that most of the students have opted for option (a). Means they want day off in a week except Sunday. Out of six days 88 students has selected Saturday as their day off.

Ninth question is that student has to select as per their preference. 1 means first and 4 means last. We have given four options (a) Lunch at 01-02 only (b) No class at 9 o'clock (c) No theory class at 9 o'clock (d) Not more than five consecutive classes in a day. For UG in the first graph, 36 students out of 85 have opted for option (b). And for PG in the second graph, 51 students out of 103 have opted for option (d). From the third graph we have observed that total 79 students out of 188 have opted for option (d). Based on this result we have analyzed that most of the students' wants to attend not more than five consecutive classes in a day.

Tenth question is that do they want any interface by which you can book your own class slot just like you are booking a movie show. We have given two options (a) yes (b) no. For UG in the first graph, 52 students out of 85 have opted for option (a). And for PG in the second graph, 73 students out of 103 have opted for option (a). From the third graph we have observed that total

123 students out of 188 have opted for option (a). Based on this result we have analyze that most of the students wants an interface by which they can book their own class slot just like they are booking a movie show.

Proposed Implementation

With the help of this survey we have analyze that there are so many students who are actually facing problems in the timetabling system and want solution of those problems. As we can see that in the current scenario there is not a way by which we can solve all these problems. Till now there is no interface by which students have the opportunity to fill their timetable or we can also say that they can make their own timetable. It is found that after allotment of timetable to each course there is no such option for user (student and faculty) to give their choice or preferences. So we are going to propose a system by which students can book their time slot of classes as they are booking timeslot for a movie show. In this proposed system, first administrator is going to set their own constraints such as room availability, available faculty members and other resources. After that, administrator have to take care about faculty also. They have to add Faculty's constraints within that system. After that the system will be ready to give to students (user). From that proposed system, student can fill the time slot whatever they want. But whatever the constraints are applied by the administrator and faculty that will remain fixed. Student can't change that and they have to fill their choice with regard to that fixed filled slot given by administrator.

This is the proposed system which is yet not implemented. We just have taken the feedback from students to know that what is the problem and where it exists. After analyze the result we have thought that yes, there is a need of this kind of interface and should be implemented. So we have decided to implement this interface. We will implement this interface in future. After making this system, students must be able to fill their time slot for classes like they are booking timeslot for a movie show. We observe from survey that proposing system is providing a best way to satisfy each and every one with timetabling system.

CONCLUSION

According to this paper a new interface is going to be implemented for creating timetable of the universities. Mainly our research paper find out that is there any problem in timetable system. If yes then where it is existing and what is solution for that can possible. It is presented that this proposed interface given to user for creating their own timetable that is better option for creation of effective timetable ever used. We find out that what are the different constrain are involve in it, different resources and their availability. Therefore it is better option to use such an interface that helps to create a timetable which is satisfied to everyone. Where users (student) have flexibility to fill their own preference or choice for timetable based upon their different constrains for lectures, laboratory, and tutorials. On the other hand administration of timetable also has to fill all the hard constraints that can be managed for both students as well as faculty members before giving to user to fill their choice. Its advantage is before giving this interface to user, timetable administrator consider all teacher's choice and their preference for timetable.

The proposed interface will be design in such a way that will satisfying all constrain and resource availability involved by timetable admin. The interface for designing timetable contains so many constraints and objective.

When we are talking about the constraints it is already mention above such as hard as well as soft constraints, and we have to take care of these along with users (students and faculty) constraints. The survey result shows that this proposed solution for timetabling problem is capable of providing a satisfaction solution in compare what we have before and provide best way for creating timetable. Future work is to implement this proposed interface and use in the universities for creates feasible and efficient timetables.

REFERENCES

1. T. Birbas · S. Daskalaki · E. Housos (28 October 2008). School timetabling for quality student and teacher schedules.
2. Katja Schimmelpfeng · Stefan Helber (7 December 2006). Application of a real-world university-course timetabling model solved by integer programming.
3. Alade O. Modupe, Omidiora E. Olusayo, Olabiyisi S. Olatunde (September 2014). Development of a University Lecture Timetable using Modified Genetic Algorithms Approach
4. TIMETABLE GENERATION SYSTEM by Anuja Chowdhary, Priyanka Kakde, Shruti Dhoke, Sonali Ingle, Rupal Rushiya, Dinesh Gawande, IJCSMC, Vol. 3, Issue. 2, February 2014, pg.410 – 414
5. SANDEEP SINGH RAWAT, LAKSHMI RAJAMANI (2005). A TIMETABLE PREDICTION FOR TECHNICAL EDUCATIONAL SYSTEM USING GENETIC ALGORITHM.
6. E.K. Burke, D.G. Elliman , R. Weare(1993). A University Timetabling System based on Graph Colouring and Constraint Manipulation.
7. A harmony search algorithm for university course timetabling by Mohammed Azmi Al-Betar; Ahamad Tajudin Khader ; Taufiq Abdul Gani.
8. Ioannis X. Tassopoulos, Grigorios N. Beligiannis (24 January 2012), Using particle swarm optimization to solve effectively the school timetabling problem.
9. Jeffrey H. Kingston (30 May 2012), Timetable construction: the algorithms and complexity perspective.
10. Edmund K. Burke, Sanja Petrovic, Rong Qu (2006), Case-based heuristic selection for timetabling problems.
11. Hana Rudová, Tomáš Müller, Keith Murray (1 May 2010), Complex university course timetabling.
12. ALBERTO COLONI, MARCO DORIGO, VITTORIO MANIEZZO (1998), Metaheuristics for High School Timetabling.
13. GLOVER, Ian (2013) Play as you learn: Gamification as a technique for motivating learners. In: Proceedings of World Conference on Educational Multimedia, Hypermedia and Telecommunications 2013. AACE, Chesapeake.
14. Justin Filippou, France Cheong, Christopher Cheong: USING DESIGN SCIENCE RESEARCH TO INCORPORATE GAMIFICATION INTO LEARNING ACTIVITIES, RMIT University, Victoria, Australia
15. Gabriel Barata, Sandra Gama, Joaquim Jorge, Daniel Gonçalves: Improving participation and learning with Gamification, INESC-ID/IST/Technical University of Lisbon, Portugal

16. Luis de-Marcos, Adrián Domínguez, Joseba Saenz-de-Navarrete, and Carmen Pagés: An empirical study comparing Gamification and social networking on e-learning, *Computers & Education* 75 (2014) 82–91
17. Kevin Browne a, Christopher Anand b, Elizabeth Gosse c: Gamification and serious game approaches for adult literacy tablet software.
18. Balraj Kumar and Parul Khurana: GAMIFICATION IN EDUCATION - LEARN COMPUTER PROGRAMMING WITH FUN, *International Journal of Computers and Distributed Systems* December 2012, Department of Computer Applications Lovely Professional University, Punjab.
19. Kavisha Duggal, Anukool Srivastav, Satvinder Kaur: Gamified Approach to Database Normalization, *International Journal of Computer Applications* (0975 – 8887), Volume 93 – No 4, May 2014
20. Jorge Simoes, Rebeca Díaz Redondo, Ana Fernandez Vilas: A social Gamification framework for a K-6 learning platform, doi:10.1016/j.chb.2012.06.007
21. Jakub Swacha, Paweł Baszuro: Gamification-based e-learning Platform for Computer Programming Education, *X World Conference on Computers in Education* July 2-5, 2013; Torun, Poland.